

### **REMARKS**

Claims 1-16 were examined and reported in the Office Action. Claims 1-16 are rejected. Claims 1, 8 and 15 are amended. Claims 1-16 remain.

Applicant requests reconsideration of the application in view of the following remarks.

#### **I. 35 U.S.C. § 102**

It is asserted in the Office Action that claims 1-5 and 8-12 are rejected under 35 U.S.C. § 102(b), as being anticipated by "Polymeric waveguide prism-based electro-optic beam deflector", Optical Engineering, Vol. 40 No. 7, July 2001, Sun et al. ("Sun"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2131, "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.' (Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)). 'The identical invention must be shown in as complete detail as is contained in the ... claim.' (Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). The elements must be arranged as required by the claim, but this is not an ipsissimis verbis test, *i.e.*, identity of terminology is not required. (In re Bond, 910 F.2d 831, 15 USPQ2d 1566 (Fed. Cir. 1990))."

Applicant's amended claim 1 contains the limitations of "[a]n opto-electronic device with an integrated light deflector, comprising: a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals; and a light deflector formed by patterning the upper cladding layer in a predetermined shape at an upper portion of the passive optical waveguide, the light deflector integrated with a laser diode, wherein a refractive index of the core under the predetermined shape is modified to deflect a light beam by applying a current or an electrical field to a particular portion of the light deflector having the

predetermined shape, and the light deflector and the laser diode made of a same material.”

Applicant’s amended claim 8 contains the limitations of “[a]n opto-electronic device with an integrated light deflector comprising: a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals; and a light deflector having an electrode formed to have a predetermined shape by patterning an upper portion of the upper cladding layer of the passive optical waveguide, the light deflector integrated with a laser diode made of the same material as the light deflector, wherein a reflective index of the core under the predetermined shape is modified to deflect a light beam propagation by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape.”

That is, Applicant’s claimed invention asserts an integrated light deflector with a light source. The light source and the light deflector are made of the same material. The refractive index of the light deflector is modified when a current or electrical field is applied to a particular portion of the light deflector having a predetermined shape. The core has a high band gap so guided light beams are not absorbed. Tuning speed is, therefore, reduced. Reliability is increased over the prior art; size is minimized and manufacturing costs are reduced over the prior art.

Sun discloses an electro-optic beam deflector. Sun further discloses that on top of the beam deflector is a gold layer patterned as a series of identical triangles having bases connected to form a top electrode. (Sun, page 1218, second paragraph; Fig. 1). Sun, however, does not teach, disclose or suggest “a light deflector having an electrode formed to have a predetermined shape by patterning an upper portion of the upper cladding layer of the passive optical waveguide, the light deflector integrated with a laser diode made of the same material as the light deflector, wherein a reflective index of the core under the predetermined shape is modified to deflect a light beam propagation by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape.”

Therefore, since Sun does not disclose, teach or suggest all of Applicant's amended claims 1 and 8 limitations, Applicant respectfully asserts that a *prima facie* rejection under 35 U.S.C. § 102(b) has not been adequately set forth relative to Sun. Thus, Applicant's amended claims 1 and 8 are not anticipated by Sun. Additionally, the claims that directly or indirectly depend on claims 1 and 8, namely claims 2-5, and 9-12, respectively, are also not anticipated by Sun for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 102(b) rejections for claims 1-5 and 8-12 are respectfully requested.

## II. 35 U.S.C. § 103

A. It is asserted in the Office Action that claims 6, 7, 13 and 14 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Sun et al. in view of U.S. Patent No. 6,511,858 issued to Watanabe ("Watanabe"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2142 "[t]o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." (*In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Further, according to MPEP §2143.03, "[t]o establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (*In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974))." "*All words in a claim must be considered in judging the patentability of that claim against the prior art.*" (*In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), *emphasis added*.)

Applicant's claims 6-7 are dependent on amended claim 1. Applicant's claims 13-14 are dependent on amended claim 8. Applicant has addressed claims 1 and 8 above in section I regarding Sun.

Watanabe discloses a semi-conductor light receiving device for use in optical communication and optical data processing. Watanabe further discloses a light receiving device having a clad layer 3 made of InGaAsP (column 6, lines 43-46), light-absorbing layer 4 made of InGaAs (*Id.*), and a first buffer layer 2 made of InP (*Id.*). Watanabe, however, does not teach, disclose or suggest "a light deflector having an electrode formed to have a predetermined shape by patterning an upper portion of the upper cladding layer of the passive optical waveguide, the light deflector integrated with a laser diode made of the same material as the light deflector, wherein a reflective index of the core under the predetermined shape is modified to deflect a light beam propagation by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape."

Moreover, by viewing the disclosures of Sun and Watanabe, one can not jump to the conclusion of obviousness without impermissible hindsight. According to MPEP 2142, [t]o reach a proper determination under 35 U.S.C. 103, the examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention 'as a whole' would have been obvious at that time to that person. Knowledge of applicant's disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the 'differences,' conduct the search and evaluate the 'subject matter as a whole' of the invention. The tendency to resort to 'hindsight' based upon applicant's disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the facts gleaned from the prior art." Applicant submits that without first reviewing Applicant's disclosure, no thought, whatsoever, would have been made to provide "a light deflector having an electrode formed to have a predetermined shape by patterning an upper portion of the upper cladding layer of the passive optical waveguide, the light deflector integrated with a

laser diode made of the same material as the light deflector, wherein a reflective index of the core under the predetermined shape is modified to deflect a light beam propagation by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape."

Neither Sun, Watanabe, nor the combination of the two, teach, disclose or suggest the limitations contained in Applicant's amended claims 1 and 6, as listed above. Since neither Sun, Watanabe, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant's amended claims 1 and 6, as listed above, there would not be any motivation to arrive at Applicant's claimed invention. Thus, Applicant's amended claims 1 and 6 are not obvious over Sun in view of Watanabe since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claims 1 and 6, namely claims 6-7, and 13-14, respectively, would also not be obvious over Sun in view of Watanabe for the same reason.

Accordingly, withdrawal of the rejections under 35 U.S.C. §103(a) for claims 6, 7, 13 and 14 are respectfully requested.

**B.** It is asserted in the Office Action that claims 15 and 16 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Sun in view of U. S. Patent No. 5,946,128 issued to Paek ("Paek"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant's amended claim 15 contains the limitations of "[a] wavelength tunable external cavity laser, comprising: a light source with an integrated light deflector comprising a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals, an active area for generating the optical signals, and the light deflector formed by patterning the upper cladding layer in a predetermined shape at an upper portion of a predetermined area of the passive optical waveguide, the light source and the integrated light deflector are made of a same material; a collimator lens for collimating a light beam emergent from the light source; and a diffraction grating for changing a diffraction angle depending on

a wavelength of the light beam through the collimator lens, wherein the light beam propagation is deflected by modifying a refractive index of the core under the predetermined shape by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape.”

Sun discloses an electro-optic beam deflector. Sun further discloses that on top of the beam deflector is a gold layer patterned as a series of identical triangles having bases connected to form a top electrode. (Sun, page 1218, second paragraph; Fig. 1). Sun, however, does not teach, disclose or suggest “...a light source with an integrated light deflector comprising a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals, an active area for generating the optical signals, and the light deflector formed by patterning the upper cladding layer in a predetermined shape at an upper portion of a predetermined area of the passive optical waveguide, the light source and the integrated light deflector are made of a same material;... wherein the light beam propagation is deflected by modifying a refractive index of the core under the predetermined shape by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape.”

Paek discloses an acousto-optic tunable filter that receives light from a light source. The tunable filter disclosed in Paek includes beam deflector 23 and a conventional diffraction grating 21. Paek is tunable depending on the variable rf control signal applied at input 30. (Paek, column 5, lines 61-63). Paek, however, does not teach, disclose or suggest “...a light source with an integrated light deflector comprising a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals, an active area for generating the optical signals, and the light deflector formed by patterning the upper cladding layer in a predetermined shape at an upper portion of a predetermined area of the passive optical waveguide, the light source and the integrated light deflector are made of a same material;... wherein the light beam propagation is deflected by modifying a refractive index of the core under the predetermined shape by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape.”

Moreover, by viewing the disclosures of Sun and Paek, one can not jump to the conclusion of obviousness without impermissible hindsight. Applicant submits that without first reviewing Applicant's disclosure, no thought, whatsoever, would have been made to provide "a light source with an integrated light deflector comprising a passive optical waveguide having a lower cladding layer, a core, and an upper cladding layer to guide and transmit optical signals, an active area for generating the optical signals, and the light deflector formed by patterning the upper cladding layer in a predetermined shape at an upper portion of a predetermined area of the passive optical waveguide, the light source and the integrated light deflector are made of a same material";... wherein the light beam propagation is deflected by modifying a refractive index of the core under the predetermined shape by applying a current or an electrical field to a particular portion of the light deflector having the predetermined shape."

Neither Sun, Paek, nor the combination of the two, teach, disclose or suggest the limitations contained in Applicant's amended claim 15, as listed above. Since neither Sun, Paek, nor the combination of the two, teach, disclose or suggest all the limitations of Applicant's amended claim 15, there would not be any motivation to arrive at Applicant's claimed invention. Thus, Applicant's amended claim 15 is not obvious over Sun in view of Paek since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claim that directly depends from amended claim 15, namely claim 16, would also not be obvious over Sun in view of Paek for the same reason.

Accordingly, withdrawal of the rejections under 35 U.S.C. §103(a) for claims 15 and 16 is respectfully requested.

**CONCLUSION**

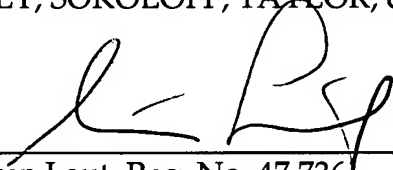
In view of the foregoing, it is submitted that claims 1-16 patentably define the subject invention over the cited references of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR, & ZAFMAN LLP

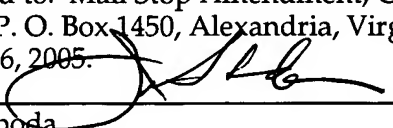
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